Note on three aberrant genera of Acridoidea from South and Central America

(Orthoptera)

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There are several genera of Acridoidea in South and Central America the systematic positions of which are obscure. They have usually been referred by authors to the subfamily *Catantopinae* and placed into one or other group of genera of this subfamily; subsequent authors have put them into other groups and thus they are still wandering from one group to another.

Recently the opportunity arose to study the genitalia, particularly the phallic complex, of three of these genera. The result of this study does not help, however, to place them definitely into groups, but it does indicate the groups in which they cannot be placed.

To create for each of these genera a separate, monogeneric taxon of the status of tribe, subfamily or family, would be premature in the present state of our knowledge of the Acridoidea fauna of South and Central America, which is probably less studied than that of any other region of the World. Further study of Acridoidea in this region will doubtless produce many more genera and species which would help to classify them more correctly.

Aucacris Hebard, 1929.

(Fig. 1).

Describing the new genus and species *Aucacris eumera,* Hebart placed it in "*Cyrtacanthacrinae*".

Uvarov (1937) transferred the genus into "*Batrachotetrigini*".

Liebermann (1942) placed it in the subfamily "*Chilacrinae*" which he had newly erected.

Rehn (1943), not being aware of Liebermann's arrangement, created the group *Aucacris,* into which he placed the genus *Aucacris* Hebard, *Cumainocloidus* Bruner and *Neuquenia* Rehn. He referred the group to the subfamily *Cyrtacanthacridinae.*

Dirsh (July 1961) referred the genus *Aucacris* to Liebermann's subfamily *Chilacridinae* of *Acrididae.*

Eades (November 1961) raised Rehn's group *Aucacris* to the status of a tribe and referred it to the subfamily "*Ommexechinae*" = *Ommexechidae.*

I have had an opportunity to study and draw the phallic complex of the type of *Aucacris eumera* Hebard and the spermatheca of this species. These are described below.

Ectophallus mostly membranous; lateral distal part of membrane forms a pair of lateral lobes, which are slightly more sclerotised than the rest of the membrane and cover the sides of the apical half of the phallic structure. Cingulum comparatively narrow; zygoma elongate; apodemes long and slender; rami small. Endophallus strongly sclerotised, robust; basal valve of penis wide; apical valve widened and upcurved in apical half, at apex subacute, in basal half strongly narrowed, but still too wide to be considered as a flexure; gonopore process short and small; ejaculatory sac elongated, large; spermatophore sac situated below and partly between the narrow parts of the apical valves of the penis. Epiphallus bridge-shaped with small non-articulated ancorae and large irregularly hook-shaped lophi with obtuse apices. Oval sclerites present.

Spermatheca with curved apical and large, sac-like, downcurved preapical diverticula.

As can be seen from Fig. 1, the structure of the phallic complex of *Aucacris eumera* has several points of great difference from *Ommexechidae,* in which, therefore, it cannot be placed. The cingulum in *A. eumera* is relatively much larger, with much more strongly developed apodemes, than in *Ommexechidae* (see plate 28, Dirsh, 1956). The penis in *A. eumera* consists of a pair of robust sclerites with upcurved apical valves and wide connecting parts between the basal and apical valves. In *Ommexechidae* (Dirsh, 1956) the apical valves of the penis are downcurved; the connecting part between the basal and the apical valves of the penis are slender, approximating to the flexure in other families. The general outline of the penis is strongly different.

The epiphallus in *A. eumera* is simple and bridge-shaped, and ancorae are present. In *Ommexechidae* the lateral plates of the epiphallus are separated from the bridge and joined to it by a membrane; ancorae are absent. The spermatheca in *A. eumera* is of the shape which is most usual in the subfamily *Acridinae;* in *Ommexechidae* it is of entirely different shape, consisting of a large, irregularly formed sac, to which a small sac-like structure is attached (Slifer, 1940).

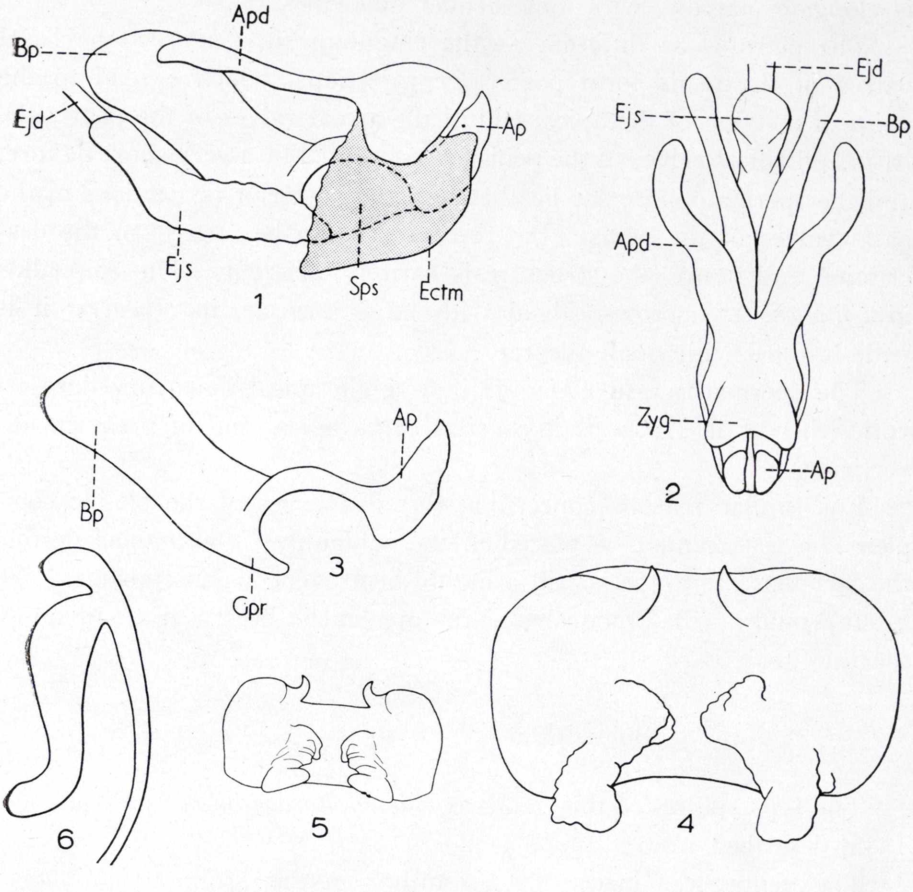

Fig. 1.—*Aucacris eumera* Hebard, 1929 (type); 1) phallic complex, lateral view: greater part of ectophallic membrane and epiphallus removed; 2) the same, from above; 3) penis, lateral view; 4) epiphallus; 5) the same epiphallus at a different angle and smaller magnification; 6) spermatheca. (Fig. 1-4, the same magnification.)

From this study of the phallic complex and spermatheca it follows that these characters do not permit placing *Aucacris* into the family *Ommexechidae.*

If one compares the phallic complex of *Aucacris* with members of the subfamily *Chilacridinae,* it appears not to belong to this subfamily either. The cingulum in *Chilacridinae (Chilacris maculipennis* Lieb.) is entirely different from that of *Aucacris,* consisting of a wide, shield-like structure with short lobiform apodemes; in *Aucacris* the cingulum is elongate, narrow, with long slender apodemes.

The penis is as different as the cingulum; in *Chilacris* the basal valves of the penis form posterior projections, which extend to the point of meeting of the apical end of the apical valves of the penis; the basal and apical valves of the penis are connected by a very short flexure, and the spermatophore sac lies between the posterior projections of the basal valves of the penis. In *Aucacris,* as can be seen from the description and figure, the structure is entirely different. The epiphallus in *Chilacris* is narrow-bridged with large ancorae, in *Aucacris* it is wide-bridged with small ancorae.

The spermatheca in *Chilacris* is a single apical downcurved reservoir, whereas in *Aucacris* it consists of an apical and of preapical diverticula.

For similar reasons concerning the differences of the phallic complex *Aucacris* cannot be placed in the subfamily *Catantopinae* despite the fact that the latter is still a highly heterogeneous assemblage.

It would not be practicable at the moment to erect a new subfamily for this genus.

Bactrophora Westwood, 1845.

The type species of this genus is *Bactrophora dominans* Westwood, 1845, described from a single female.

The genus was placed by its author in the group *"Conophori"* Kirby, 1910, placed it in the subfamily *"Cyrtacanthacrinae"*. Rehn (1938) placed it in his group *Euthymiae.* The systematic position of the genus still remains obscure.

The structure of the phallic complex of *Bactrophora dominans* described below makes the position of the genus more obscure than ever; it cannot be linked closely with any known groups of *Acridoidea* of family or subfamily level.

Phallic complex: Ectophallic membrane thin. Cingulum strongly sclerotised, elongate, shield-like, covering endophallus; proximal end of it forms a pair of small projections which can be regarded as apodemes, in which case the whole dorsal part ought to be considered as the zygoma; in the distal part of the cingulum there are lateral lobes (rami?) protruding downwards, to which the upturned elongate sclerites are articulated. These sclerites cover the ventro-posterior part of the apical valves of the penis. Endophallus extremely robust; penis is formed by a pair of undivided sclerites; basal valve of penis large, gonopore process short, apical valve of penis simple, slightly upcurved at apex and covered by a membranous, slightly sclerotised, sheath, tuberculate in basal part. Ejaculatory sac large, muscular, covered with long, spine-like bristles. Spermatophore sac situated below apical valves of penis. Epiphallus bridge-shaped, without ancorae and with a pair of tooth-like lophi; oval sclerites present.

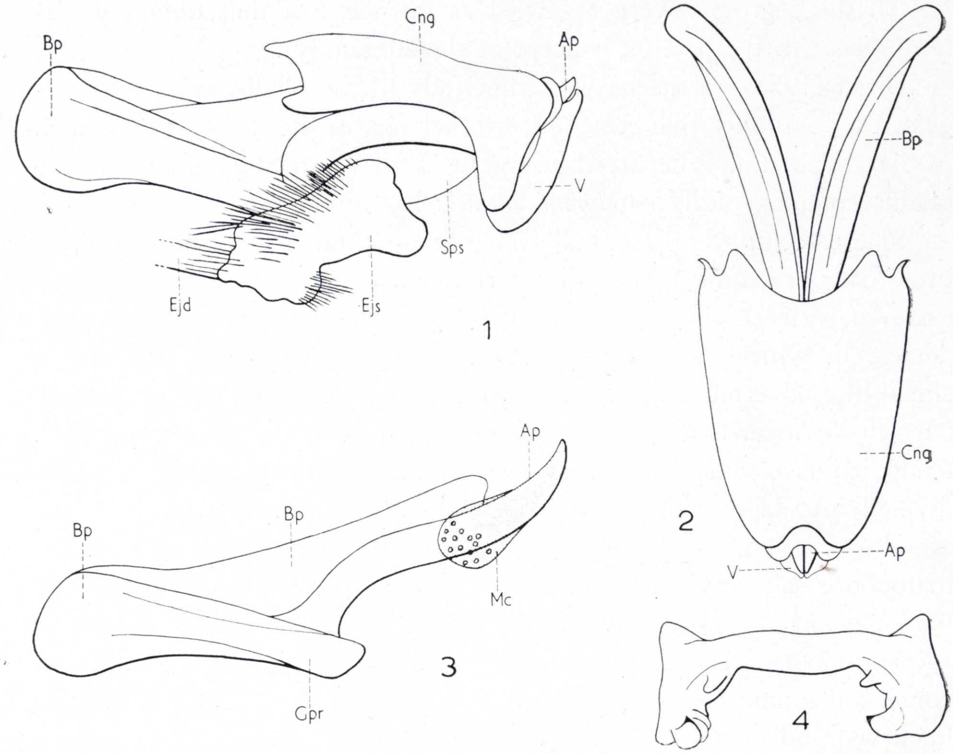

Fig. 2.—*Bactrophora dominans* Westwood, 1845; 1) phallic complex, lateral view: ectophallic membrane and epiphallus removed; 2) the same, from above; 3) penis, lateral view; 4) epiphallus, slightly tilted to the left.

It is difficult to suggest the relationship of *Bactrophora* with other *Acridoidea.* The structure of the penis suggests a remote connection with *Chilacridinae* and partly with *Romaleinae,* but no definite conclusion can be offered here.

Rhicnoderma Gerstaecker, 1889.

When describing the genus *Rhicnoderma,* Gerstaecker did not define its systematic position. Brunner (1893) placed it in the group *Mezentiae.* Rehn (1905) placed it in the "subfamily *Locustinae*". Ramme (1929) referred it to the group *Euthymiae,* and Rehn in 1938 also considered it as a member of this group.

All these groups were regarded as members of the subfamily *Catantopinae* (in the present concept of the subfamily).

Dirsh (1956) on the basis of the study of the phallic complex, suggested a possibility that *Rhicnoderma* belongs to the family *Lentulidae.*

An opportunity occurred to make a more detailed study of the phallic complex of *Rhicnoderma humile* Rehn, 1905.

Phallic complex: Ectophallic membrane thin. Cingulum small, in proximal part ending in a pair of rounded projections with a shallow excision between them; these may be considered as rudimentary apodemes, in which case the zygoma is comparatively long, forming a shield-like covering of the dorsal part of the endophallus; rami small, curved downwards an almost touching each other on the ventral side. Endophallus consists of a very slender pair of valves, which are not divided into basal and apical valves, they are uniformly straight and are downcurved basally only, the apical part being upcurved. Spermatophore sac very large, almost as long as the whole penis, and situated below the penis valves; ejaculatory sac large, placed at base of spermatophore sac. Epiphallus narrowly bridge-shaped, without ancorae and lophi; posterior ends of lateral plates narrowed and slightly upcurved and incurved; oval sclerites present.

From the description it is clear that the phallic complex of *Rhicnoderma* is slightly similar to that in *Lentula* (Dirsh, 1956). However, it differs in several essential points: in *Lentula* the cingulum is approximately capsule-like in form, with very well differentiated apodemes; the spermatophore sac is large as in *Rhicnoderma,* but is placed above the penis, whereas in *Rhicnoderma* it is below; and the ejaculatory sac in *Lentula* is small, whereas in *Rhicnoderma* it is very large.

Thus there are points of similarity between *Rhicnoderma* and *Lentula* but also even more dissimilarities.

It seems that for the time being the genus *Rhicnoderma* must remain in the same uncertain position as the two previous genera.

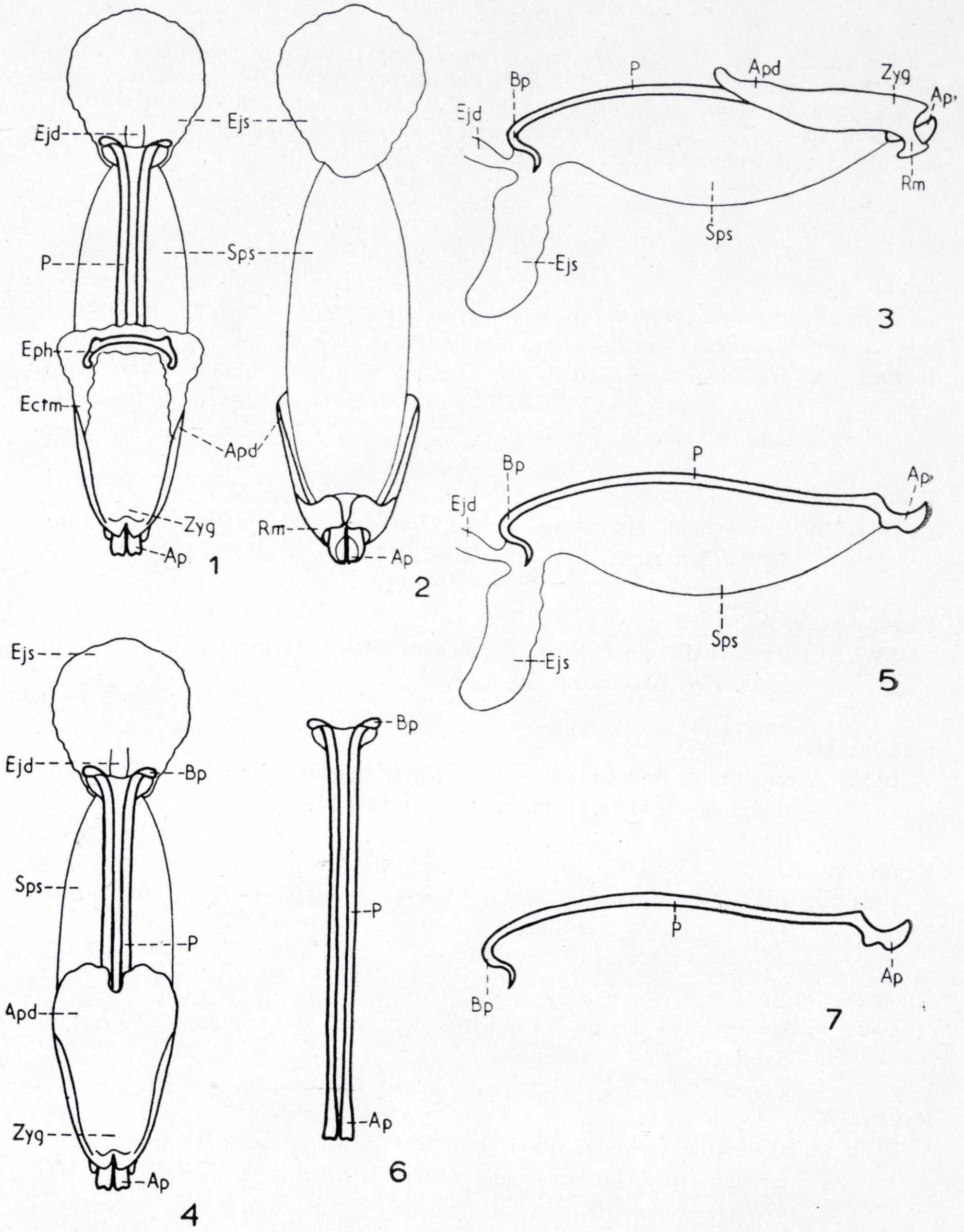

Fig. 3.—*Rhicnoderma humile* Rehn, 1905; 1) phallic complex from above: proximal part of ectophallic membrane removed; 2) the same, from below; 3) the same, lateral view; 4) the same as 1, but epiphallus removed; 5) endophallus, lateral view; 6) valves of penis, from above; 7) valve of penis, lateral view.

Symbols used in figures 1-3.

Ap, apical valve of penis. *Apd,* apodemus. *Bp,* basal valve of penis. *Cng,* cingulum. *Ectm,* ectophallic membrane. *Ejd,* ejaculatory duct. *Ejs,* ejaculatory sac. *Eph,* epiphallus. *Gpr,* gonopore process. *Mc,* membranous, slightly sclerotised, sheath of apex of penis. *P,* penis. *Rm,* ramus. *Sps,* spermatophore sac. *V,* sclerite articulated with ventral part of cingulum. *Zyg,* zygoma.

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